

Finding Vertex - Mixed Practice

Name _____

Date _____

Block _____

For each quadratic:

- State whether the vertex will be a maximum or minimum
- Give the equation for the axis of symmetry
- State the vertex

Vertex Form

1. $f(x) = 3(x-4)^2 + 6$

2. $f(x) = -2(x+9)^2 - 5$

3. $f(x) = (x+7)^2$

4. $f(x) = (x-2.3)^2 - 1.5$

5. $f(x) = -8.9(x-6.97)^2 - 9.24$

6. $f(x) = -(x + \frac{4}{9})^2 - 2\frac{6}{7}$

Standard Form - Find Algebraically

7. $f(x) = x^2 + 6x + 3$

8. $-2x^2 - 8x + 10 = f(x)$

9. $f(x) = -x^2 + 5x + 1$

10. $f(x) = 5x^2 - 9$

11. $f(x) = 3x^2 - 2x$

12. $f(x) = 16 - x + 3x^2$

Standard Form - Find with Graphing Calculator

13. $f(x) = 3x^2 - 7x + 2$

14. $f(x) = -4x^2 - 9x - 3$

15. $f(x) = 0.3x^2 - 1.8x - 5.6$

16. $f(x) = -\frac{1}{2}x^2 + \frac{3}{8}x + \frac{7}{16}$

17. $f(x) = 3x^2 - 24x - 7$

18. $f(x) = -x^2 - 12x + 4$

You Choose the Method

19. $f(x) = -3x^2 - 12x - 7$

20. $f(x) = 5(x-3)^2 + 2$

21. $f(x) = 2x^2 - 2x + 5$

22. $f(x) = -2x^2$

23. $f(x) = x^2 - 9$

24. $f(x) = -(x + \frac{1}{3})^2 + \frac{2}{3}$

25. $f(x) = x^2 + 3x + 11$

26. $f(x) = 4x + x^2 - 9$

27. $f(x) = 5(x-1)^2 - 7$

28. $f(x) = 4(x+0.6)^2 + 0.43$

Finding Vertex - Thinking it Through

Find the vertex in each table. State whether it's a Max or min

1.

x	y
-2	8
-1	3
0	0
1	-1
2	0
3	3

2.

x	y
-2	27
-1	12
0	3
1	0
2	3
3	12

3.

x	y
1	-4
2	1
3	4
4	5
5	4
6	1

4.

x	y
-4	26
-3	6
-2	-6
-1	-10
0	-6
1	6
2	26

5.

x	y
-4	-18
-3	-8
-2	-2
-1	0
0	-2
1	-8
2	-18

6.

x	y
-5	-22
-4	-7
-3	2
-2	5
-1	7
0	-7
1	-22

7.

x	y
-1	0
0	-6
1	-8
2	-6
3	0
4	10

8. An object thrown into the air is modeled by the equation: $h(t) = -4.9t^2 + v_0t + h_0$ where v_0 is the initial velocity, h_0 is the initial height above the ground and $h(t)$ is the height after t seconds.

A person throws a ball with an initial upward velocity of 12 m/sec. The ball is released when it is 1.8 meters from the ground.

- Find the equation that would give the height of the ball t seconds later.
- After how many seconds will the ball reach its peak (i.e. maximum height)?
What will the maximum height be?
Use at least two methods.

9. Kevin wants to fence in his backyard using a rectangular region so that his dogs can have a safe play area. He has purchased 140 feet of fencing. To help the fencing cover a greater square area, Kevin will use the back of his house as one side of the enclosed yard.

Let x = width of rectangle

- Find the equation that would give the area of the rectangular region that Kevin fenced in. Include a drawing to show how you determined the equation.
- Find the maximum area that can be enclosed.
- Find the dimensions that produce the maximum area.

10. Quad Hardware Company produces c-clamps. The production cost will go down the more units the company produces. However, you also know that production costs will eventually go up if you make too many c-clamps, due to storage requirements and overtime pay. The equation to produce x thousands of c-clamps a day can be approximated by the following formula:

$$C = 0.08x^2 - 8.5x + 2600 \text{ cost is in thousands of dollars.}$$

- Find the daily production level of c-clamps that will minimize production costs for Quad Hardware.